

DCD-2000/5-14
MAGNETIZING POWER SOURCE
(Cabinet-Style)

USER'S MANUAL



YUXIANG MAGNETIC MATERIALS IND.CO, LTD.
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Instruction Manual for Use and Maintenance

Thank you for choosing our DCD series of Capacitance magnetizing power sources. Please read this instruction manual carefully in order to obtain the best result in using our products.

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1. Introduction

Due to the continuous development of new permanent-magnet materials in recent years, there has been higher and higher demand for means of magnetization, especially for rare-earth magnet steels, where the old type of magnetizing devices simply would not work. Because rare-earth magnet steels have high coercivity,very strong magnetic field has to be applied to get the magnetic domains lined up well. In order to solve this problem, we have developed the DCD series of new magnetizing power sources, or high-voltage-and-large-current capacitance magnetizing power sources. These devices cannot only solve the problem of the magnetization of rare earth magnet steels, but can also serve as all-purpose magnetizing power sources. It can be used to magnetize all kinds of permanent-magnet materials, and produces much better effect than obtainable with the old type of magnetizing devices. Another advantage of the DCD series is that their use is not restricted by the capacity of the power supply. That is to say, power supply of small capacity can yield large instantaneous power and thus create a strong magnetic field.Therefore,besides magnetization, the DCD devices can also be used in plasma research, electromagnetic forming, superconductivity research, research on physical properties in strong magnetic fields,etc.

The capacitance magnetizing power source is composed of six parts: a power supply system, a rectification system, an energy storage system, an energy release system, a control system, and a monitoring system.

The operating principle:

220V~50Hz single-phase AC is boosted to a high voltage, rectified, and used to supply energy to the energy storage system. Then, the control system is used to release the energy instantaneously through a magnetizing current can be adjusted to purpose by controlling the charge voltage (or the amount of energy stored). The BLODI (block diagram) is as follows:

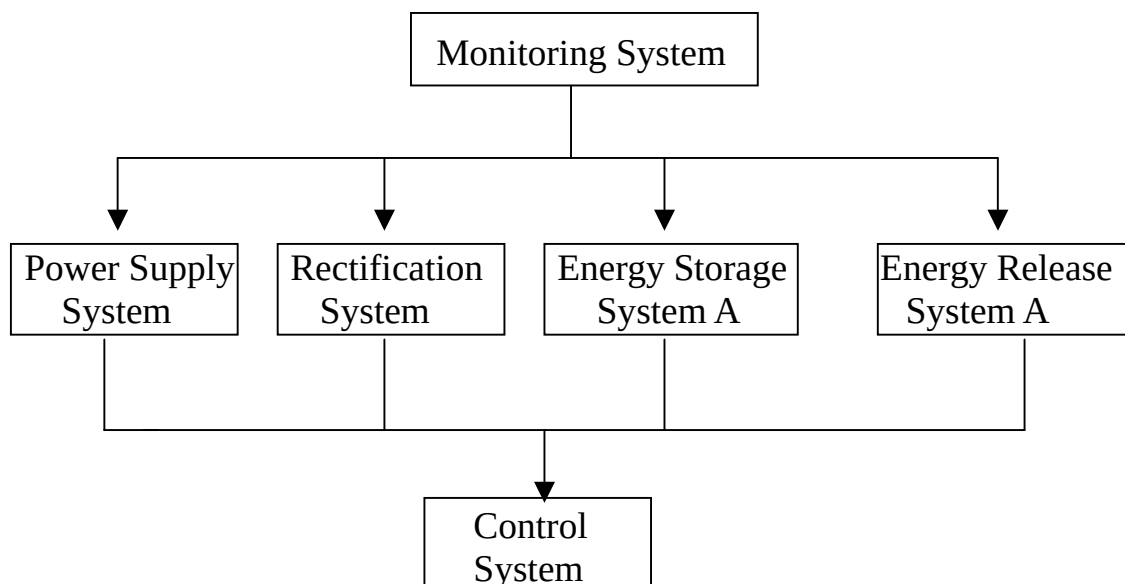


Figure 1-System Diagram of the Magnetizing Power Source

2. Technical Qualifications

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A. Operating Conditions:

Voltage of power supply:	220V $\pm$ 10%
Frequency of power supply:	50Hz
Ambient temperature:	-10 ~ +40℃
Relative humidity:	$\leq$ 95%(25℃)
Altitude:	$\leq$ 1000 m

B. Technical Specifications:

Model	DCD-2000/5-14
Input current	< 20 A
Maximum output current (peak value)	50,000 A
Charge voltage	200 ~ 2,000 V
Charge time	< 5S
Capacitance	1,400 μ F
Volume	720 x 1,100 x 1,200 mm ³
Weight	250 kg
Demagnetization function	NO

3. Structural Features

- 1) IC used for the control system, and silicon-controlled switches used for both charging and discharging; no contact loss in normal operation, resulting in not only low consumed power, but also high efficiency, long life-span, and thus making the product safe and reliable.
- 2) Equipped with a remote-control socket, and thus easy to operate from a distance
- 3) Self-control device for charge voltage, with charging automatically terminated when selected voltage is attained, making the device convenient to use;
- 4) Both manual and automatic operation allowed, making the device especially suited to use on assembly lines;
- 5) High-voltage magnetization used, with reverse current automatically eliminated; impedance of the magnetizing coil can be varied within a broad range, and there is no need to worry about vibrations due to improper design of the coil; coils easy to design, making the device suitable for magnetization of all kinds of permanent magnet materials.
- 6) No demagnetization function.
- 7) Equipped with surge protection system, so that even if the automatic control system for charging voltage is out of order, the charging voltage would not exceed the maximum voltage allowed, for the surge protection system would automatically cut off electric supply to the capacitor and discharge the electricity already charged, stopping the working of the whole operation system, thereby instructing the operator to stop and check for failure of the automatic control systems.

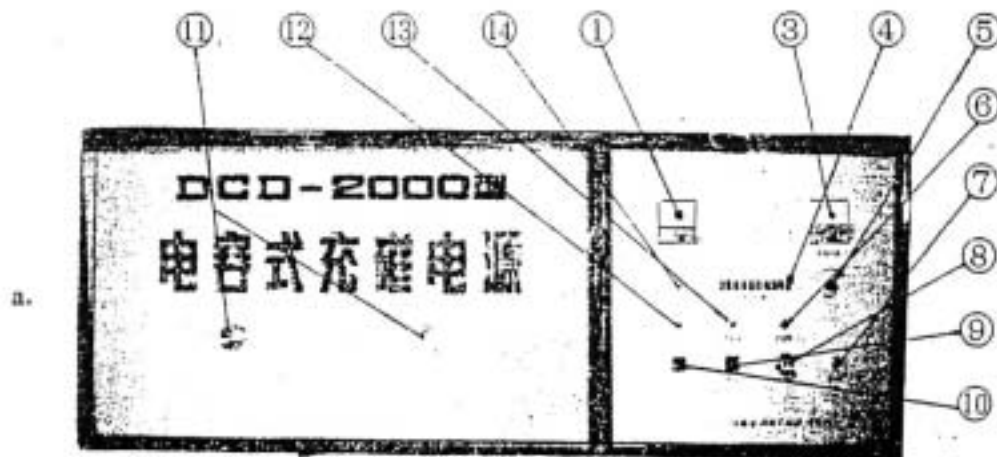


Figure 2 – Front Panel

4. The Components and Their Functions

- 1) Ammeter-to monitor changes in the charging current;

- 2) Voltmeter-to show the magnetizing voltage of the capacitor;
- 3) Push buttons for voltage selection-can be used to choose magnetizing voltage within the range 200~2,000V;
- 4) Venire knob-to fine-tune the voltage between two adjustable grades;
- 5) Power indicator light-lit up when power is turned on;
- 6) Remote-control socket-for operation from a distance(e.g., by using footswitch or position switch on an assembly line);
- 7) Power switch-to turn on/off single-phase 220V power input; discharges the voltage in the capacitor when turned off;
- 8) Magnetize button and indicator-indicates the device is magnetizing when this light is on;
- 9) Charge button and indicator-indicates the device is charging when this light is on;
- 10) Wiring terminals-for connection with magnetizing coil(the magnetizing head);
- 11) Charge waiting signal-indicates the device is ready to charge when this light is on;
- 12) Magnetize waiting signal-indicates the device is ready to magnetized when this light is on;
- 13) Manual/Automatic tumbler-when operating manually, push the charge button each time before charging, and wait until the magnetize waiting signal is on before magnetizing; when operating automatically, push the charge button only once(when the power is turned on),and wait until the magnetized waiting signal is on before magnetizing(charging will proceed automatically without the operator having to push the charge button);
- 14) Lead wire for 220V AC-to be connected to single-phase 220V power supply;

5. Directions for Operation

A. Magnetization

- 1) Connect the magnetizing head to the wiring terminals (11),connect the device to the power supply(single-phase 220V AC),and then turn on the power switch. At this point, the power indicator light and charge-waiting signal ought to light up.
- 2) Calculate the approximate DC voltage that ought to be applied to obtain the desired magnetic field strength needed for magnetizing. For example, if 1.4KV ought to be applied, then push down the button for 1.4kv.If the desired voltage is between two grades, use the venire knob to fine-tune.
- 3) Push down the charge button. The reading of the voltmeter ought gradually to increase from zero to the desired voltage, while that of the ammeter gradually decreases from the maximum. When the voltage reaches the desired level, the control system will automatically stop charging. The magnetize indicator should light up, indicating the device is ready for magnetization.
- 4) Push down the magnetize button. The reading of the voltmeter ought to drop to zero immediately, and magnetization is completed.
- 5) If charging is completed but for some reason(such as the voltage is too high or too low),it is decided not to start the magnetization process, the electrical charge in the capacitor should be discharged. To do this ,just turn off the power switch, and the

electric charge in the capacitor will automatically be discharged.

6) Make sure the power switch is turned off upon finishing using the device.

6. Maintenance

1).All the components of the control system are on the control panel. Please keep these components clean when using the device. The control panel should be cleaned once a year.

2).Avoid using the device where temperature or humidity is high.

Caution:

1).When it is necessary to open the right door or rear door(or the cover on top for the box-style device)to check for a failure, the power switch must be turned off, and the power cord disconnected.

2).When installing the device, makes sure the ground connection for power supply is properly grounded.

3).The object to be magnetized and the magnetizing coil have to be tightly fixed in their positions to prevent them from flying up during magnetization.